

IN THE CLAIMS

1. (Currently Amended) A method of determining a distance between a transmitting station and a receiving station comprising the steps of:
 - determining a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of the receiving station, wherein the characteristic parameter describes excess path lengths caused by obstacles in the environment by means of one of a number of discrete levels;
 - measuring at least one feature of a signal received from the transmitting station at the receiving station, said feature being such that it can be used for determination of the distance between the transmitting station and the receiving station; and
 - computing the distance between the transmitting station and the receiving station using said measured signal feature and the characteristic parameter describing the line-of-sight conditions of the receiving station.
2. (Original) A method according to claim 1, further comprising a step of determining the current geographical location of the transmitting station.
3. (Currently Amended) A method according to claim 1-~~or~~-2, further comprising:
 - determining at least one further distance between the transmitting station and at least one further receiving station having a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of the at least one further receiving station; and
 - determining the current geographical location of the transmitting station based on the determined distances between the transmitting station and said at least two receiving stations.
4. (Original) A method according to claim 1, further comprising:

determining at least one further distance between the receiving station and at least one further transmitting station having a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of the at least one further transmitting station; and

determining the current geographical location of the receiving station based on the determined distances between the receiving station and said at least two transmitting stations.

5. (Currently Amended) A method according to ~~any of the preceding claims~~claim 1, wherein said ~~at least one feature to be measured comprises at least~~ travel time of the signal between the transmitting and receiving stations.

6. (Currently Amended) A method according to ~~any of the preceding claims~~claim 1, wherein said ~~at least one feature to be measured comprises at least~~ signal travel time differences between the transmitting and receiving stations.

7. (Currently Amended) A method according to ~~any of the preceding claims~~claim 1, wherein said ~~at least one feature to be measured comprises the at least~~ strength of the received signal.

8. (Currently Amended) A method according to ~~any of the preceding claims~~claim 1, wherein said ~~at least one feature to be measured comprises the~~ quality of the received signal.

9. (Currently Amended) A method according to ~~any of the preceding claims~~claim 1, comprising use of a weighted least square method for the determination of distances between the receiving and transmitting stations, wherein the used weighting matrix is the inverse of an error covariance matrix.

10. (Currently Amended) A method according to ~~any of the preceding claims~~claim 1, comprising steps of:

defining the radio propagation environments for several stations; and classifying the stations in different radio propagation environment classes; wherein the characteristic parameter is based on the class of the station.

11. (Currently Amended) A method according to ~~any of the preceding claims~~claim 1, wherein the data for the characteristic parameter is stored and processed in a location service node implemented in a telecommunications system.

12. (Currently Amended) A method according to ~~any of the preceding claims~~claim 1, wherein the stations are connected to a mobile telecommunications system, the transmitting station being a mobile station and the receiving station being a base station of the mobile telecommunications system or vice versa.

13. (Currently Amended) A method according to ~~any of the preceding claims~~claim 1, wherein the determination of the characteristic parameter comprises steps of:

determining the current geographical location of at least one of the stations by means which are external to the telecommunications system; and

inputting the results of the determination to the telecommunications system.

14. (Original) A method according to claim 13, comprising use of a satellite based positioning system for the determination of the current geographical location of at least one of the stations.

15. (Currently Amended) An arrangement for determining a distance between a transmitting station and a receiving station, comprising:

storage means for storing a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of the receiving station,

wherein the characteristic parameter describes excess path lengths caused by obstacles in the environment by means of one of a number of discrete levels;

measurement means for measuring a feature of a signal transmitted from the transmitting station to the receiving station for determination of the distance between the transmitting station and the receiving station;

a controller for receiving the outcome of said measurement and for defining the distance between the transmitting station and the receiving station on the basis of the outcome of the measurement and said characteristic parameter.

16. (Original) An arrangement according to claim 15, wherein the controller comprises means for determining a current geographical location of one of the stations.

17. (Original) An arrangement according to claim 16, comprising:

at least one further receiving station having a substantially fixed location and provided with a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of said at least one further receiving station;

means for measuring a feature of a signal transmitted from the transmitting station to the at least one further receiving station for determination of the distance between the transmitting station and the at least one further receiving station;

wherein the arrangement is such that the outcome of the measurement of the feature of the signal transmitted to the at least one further receiving station is also used when determining the location of the transmitting station.

18. (Original) An arrangement according to claim 16, comprising:

at least one further transmitting station having a substantially fixed location and provided with a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of said at least one further transmitting station;

means for measuring a feature of a signal transmitted from the at least one further transmitting station to the receiving station for determination of the distance between the receiving station and the at least one further transmitting station;

wherein the arrangement is such that the outcome of the measurement of the feature of the signal transmitted from the at least one further transmitting station is also used when determining the location of the receiving station.

19. (Currently Amended) An arrangement according to ~~any of claims 15 to 18~~claim 15, wherein different radio propagation environments of different stations are classified in different radio propagation environment classes and the characteristic parameter is based on the class of the station.
20. (Currently Amended) An arrangement according to ~~any of claims 15 to 19~~claim 15, wherein the feature of the signal is based on one or several of the following: travel time of the signal between the transmitting and receiving stations, signal travel time difference between the transmitting and receiving stations, the strength of the received signal, the quality of the received signal.
21. (Currently Amended) An arrangement according to ~~any of claims 15 to 20~~claim 15, comprising a mobile telecommunications system, wherein the transmitting station is a mobile station and the receiving station is a base station of the mobile telecommunications system or vice versa.
22. (Original) An arrangement according to claim 21, wherein the receiving station comprises a sector antenna.
23. (Currently Amended) A location server for use in a telecommunications system for provision of location data of a mobile station having a radio connection with at least one base station of the telecommunications system, comprising:
 - means for receiving measurement data from the telecommunications system concerning a feature of the connection between the mobile station and the base station for determination of the distance between the mobile station and the base station;
 - storage means for storing a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of the base station, wherein the characteristic parameter describes excess path lengths caused by obstacles in the environment by means of one of a number of discrete levels;

control means for defining the distance between the mobile station and the base station on the basis of the received measurement data and said characteristic parameter.

24. (Currently Amended) An arrangement in a telecommunications system for creating and/or updating data concerning the radio propagation environment of a station of the telecommunications system, comprising:

a first station;

a second station for communicating by radio with the first station;

means for defining the current geographical location of the first station by means of a source of location information that is external to the telecommunications system;

determining means for determining a feature of a radio signal received by one of the stations from the other of the stations; and

calculating means for calculating a parameter describing the line-of-sight conditions of the radio propagation environment by means of the determined current geographical location of the first station and the said determined feature, wherein the parameter describes excess path lengths caused by obstacles in the environment by means of one of a number of discrete levels.

25. (Original) An arrangement according to claim 24, comprising means for receiving signals from a satellite based positioning system.

26. (Currently Amended) An arrangement according to claim 24 or 25, comprising means for determining if an update of the data concerning the radio propagation environment is required.

27. (Currently Amended) An arrangement according to ~~any of claims 24 to 26~~ claim 24, wherein the first station comprises a portable device comprising the determining means for determining the feature of the radio signal.